

CLAIMS

1 1. A magnetic head including a giant magnetoresistance (GMR) read head including a
2 plurality of films, comprising:
3 a GMR read sensor;
4 a first electrical conductor layer including at least one electrically conducting film,
5 said first electrical conductor layer being disposed proximate said GMR read sensor in electrical
6 connection therewith;
7 said first electrical conductor layer including an inner end face that is generally
8 perpendicular to a film surface of the GMR read sensor.

1 2. A magnetic head as described in claim 1 wherein said first electrical conductor layer is
2 disposed above said GMR read sensor.

1 3. A magnetic head as described in claim 1 wherein said first electrical conductor layer is
2 disposed below said GMR read sensor.

1 4. A magnetic head as described in claim 2 wherein a longitudinal bias (LB) stack including
2 a plurality of films is disposed above said GMR read sensor.

1 5. A magnetic head as described in claim 3 wherein a longitudinal bias (LB) stack including
2 a plurality of films is disposed above said GMR read sensor.

1 6. A magnetic head including a GMR read head, comprising:

2 a bottom magnetic shield layer;
3 a bottom electrically insulating layer being disposed upon said bottom magnetic shield
4 layer;
5 a GMR read sensor, including a plurality of films being disposed upon said bottom
6 insulating layer;
7 two first electrical conductor layers being disposed in a spaced apart relationship
8 proximate said GMR read sensor, each of said first electrical conductor layers having an inwardly
9 disposed face that is formed in a generally perpendicular orientation relative to a film surface of
10 the GMR read sensor;
11 a longitudinal bias (LB) layer being disposed proximate said GMR read sensor;
12 a second electrically insulating layer being disposed above said GMR read sensor; and
13 a top magnetic shield layer being disposed above said second insulating layer.

1 7. A magnetic head as described in claim 6 wherein said first electrical conductor layers are
2 disposed above said GMR read sensor.

1 8. A magnetic head as described in claim 6 wherein said first electrical conductor layers are
2 disposed below said GMR read sensor.

1 9. A magnetic head as described in claim 7 wherein said longitudinal bias (LB) layer is
2 disposed above said GMR read sensor.

1 10. A magnetic head as described in claim 8 wherein said longitudinal bias (LB) layer is
2 disposed below said sensor layer.

1 11. A hard disk drive including a magnetic head that includes a GMR read head, comprising:
2 a bottom magnetic shield layer;
3 a bottom electrically insulating layer being disposed upon said bottom magnetic shield
4 layer;
5 a GMR read sensor, comprising a plurality of films, being disposed upon said bottom
6 insulating layer;
7 two first electrical conductor layers being disposed in a spaced apart relationship
8 proximate said GMR read sensor, each of said first electrical conductor layers having an inwardly
9 disposed face that is formed in a generally perpendicular orientation relative to a film surface of
10 said GMR read sensor;
11 a longitudinal bias (LB) layer being disposed proximate said GMR read sensor;
12 a top electrically insulating layer being disposed above said GMR read sensor; and
13 a top magnetic shield layer being disposed above said top insulating layer.

1 12. A magnetic head as described in claim 11 wherein said first electrical conductor layers
2 are disposed above said GMR read sensor.

1 13. A magnetic head as described in claim 11 wherein said first electrical conductor layers
2 are disposed below said GMR read sensor.

1 14. A magnetic head as described in claim 12 wherein said longitudinal bias (LB) layer is
2 disposed above said GMR read sensor.

1 15. A magnetic head as described in claim 13 wherein said longitudinal bias (LB) layer is
2 disposed below said GMR read sensor.

1 16. A method for fabricating a GMR read head portion of a magnetic head, comprising:
2 fabricating a bottom magnetic shield layer;
3 fabricating a bottom electrically insulating layer upon said bottom magnetic shield layer;
4 fabricating a GMR read sensor including a plurality of films;
5 fabricating a first electrical conductor layer on a surface plane of said GMR read sensor;
6 fabricating monolayer photoresist mask upon said first electrical conductor layer, said
7 etching mask including a read width trench formed therethrough;
8 reactive-ion-etching said first electrical conductor layer through the read width trench to
9 create two first electrical conductor layers;
10 fabricating a second electrically insulating layer above said GMR read sensor layer; and
11 fabricating a top magnetic shield layer upon said second electrically insulating layer.

1 17. A method for fabricating a GMR read head portion of a magnetic head, as described in
2 claim 16, wherein said two first electrical conductor layers are formed with opposing end faces
3 that result from the reactive-ion-etching, wherein said end faces are generally perpendicular to a
4 film surface of said GMR read sensor.

1 18. A method for fabricating a read head portion of a magnetic head, as described in claim
2 17, wherein the step of fabricating a GMR read sensor including a plurality films is performed
3 before the steps of fabricating a first conductor layer, and fabricating a monolayer photoresist
4 mask, and reactive-ion-etching a read width.

1 19. A method for fabricating a read head portion of a magnetic head, as described in claim
2 17, wherein the step of fabricating a first electrical conductor layer, and the step of fabricating
3 monolayer photoresist mask, and the step of reactive-ion-etching a read width within said first
4 electrical conductor layer are all performed prior to the step of fabricating a GMR read sensor
5 comprising a plurality of films.

1 20. A method for fabricating a read head portion of a magnetic head as described in claim 18,
2 further including the step of fabricating a longitudinal bias (LB) layer proximate said GMR read
3 sensor.

1 21. A magnetic head including a read head portion that is fabricated by a method comprising
2 the steps of:
3 fabricating a bottom magnetic shield layer;
4 fabricating a bottom electrically insulating layer upon said bottom magnetic shield layer;
5 fabricating a GMR read sensor including a plurality of films;
6 fabricating a first electrical conductor layer on the film surface of said GMR read sensor;
7 fabricating monolayer photoresist mask upon said first electrical conductor layer, said
8 mask including a read width trench formed therethrough;

9 reactive-ion-etching a read width trench within said first electrical conductor layer to
10 create two first electrical conductor layers;
11 fabricating a top electrically insulating layer above said GMR read sensor; and
12 fabricating a top magnetic shield layer upon said top electrical insulation layer.

1 22. A magnetic head, as described in claim 21, wherein said two first electrical conductor
2 layers are formed with opposing end faces that result from the reactive-ion-etching, wherein said
3 end faces are generally perpendicular to a film surface of said GMR read sensor.

1 23. A magnetic head, as described in claim 22, wherein the step of fabricating a GMR read
2 sensor including said plurality of films is performed before the steps of fabricating a first
3 conductor layer, fabricating monolayer photoresist mask, and reactive-ion-etching a read width
4 trench.

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1 24. A magnetic head, as described in claim 22, wherein the step of fabricating a first
2 electrical conductor layer, and the step of fabricating an monolayer photoresist mask, and the step
3 of reactive-ion-etching a read width trench within said first electrical conductor layer are all
4 performed prior to the step of fabricating a GMR read sensor.

1 25. A magnetic head as described in claim 23, further including the step of fabricating a
2 longitudinal bias (LB) layer proximate said GMR read sensor.